

BENEFITS OF TELEMEDICINE

In this paper we introduce a brief examination of the benefits realized from the growing use of telemedicine from three perspectives: 1) Economic development and quality of life, 2) Patients, and 3) Providers. We conclude with a brief introduction to telemedicine challenges.

Telehealth is “the practice of healthcare delivery using telecommunications technology including but not limited to diagnosis, consultation, treatment, transfer of medical data, education, dissemination of public health alerts and/or emergency updates”. Telemedicine is “the use of telecommunications technology to deliver clinical diagnosis, services and patient consultation”.¹ Applications can be real-time or store-and-forward. For the purposes of this paper we limit discussion solely to telemedicine, recognizing the many inter-locking linkages with the larger topic of telehealth.

The costs of health care impose an enormous burden on the economy. The latest projections from the Centers for Medicare & Medicaid Services show that annual health-care expenditures are expected to reach \$3.1 trillion by 2012, growing at an average annual rate of 7.3% during the forecast period or 17.7% of gross domestic product, up from 14.1% today.² Telemedicine will become a multi-billion dollar industry.³ But just what are the benefits of telemedicine?^{4,5}

ECONOMIC DEVELOPMENT AND QUALITY OF LIFE PERSPECTIVE

- **Advancements in delivery of services**

Certain health services can be greatly enhanced via telemedicine. For example, home health services are receiving a great deal of attention and investment in some states. Telemedicine technologies enable home health providers to redefine patient treatment plans, as they are able to increase patient visits due to elimination of a significant percentage of travel to patients' homes.⁶ Rural patients can now have access to specialists.⁷

- **Keeps dollars in the local economy**

Telemedicine helps provide service locally so people don't have to travel out of the community for care. Spending on health care is an especially significant portion of any economy, especially rural economies. The more of those dollars that can be kept locally the better off the local economy will be. Standard economic multiplier effects also apply here -- any money spent locally ripples through the local economy.

- **Aids business recruitment and retention**

Telemedicine provides the capability to deliver clinical services in the community. Locally available quality health care and quality schools are two important factors in the recruitment of new businesses, especially for businesses in rural communities. So there is a potential business recruitment and retention factor to consider.

- **Workforce development / jobs**

There is a severe shortage of medical staff, particularly nurses, in rural hospitals.^{8,9,10} At the same time there is high poverty and unemployment in our rural communities.¹¹ One way to address that problem is to equip local healthcare facilities with advanced telecommunications services for telemedicine purposes and then to appropriately share the videoconferencing capability in a partnership with educational institutions to train more local people for the jobs in health care that are available locally. Local jobs for local people could be a significant economic impact particularly for people who could not afford to travel

outside the community for training.

- **Quality of life and longevity gains are worth a lot**
Use of telemedicine can have a significant impact on individual health and can therefore favorably impact longevity. The value to the economy of improvements in life expectancy is about as large as the value of all other consumption goods and services put together. It is an intriguing thought to contemplate that the social productivity of health-care spending might be many times that of other spending.¹²
- **Clinical trials**
Clinical trials represent a multi-billion dollar business that could apply telemedicine technologies to extend the reach of clinical trials to include provider and patient participation from rural communities.¹³

PATIENT'S PERSPECTIVE

- **Access to healthcare**
Access to quality, state of the art health care in underserved areas, such as rural communities, is one of the most important promised benefits of telemedicine. Rural residents are not second-class citizens; they deserve access to health care services that those in metropolitan areas enjoy. Over 55 million people (20% of the U.S. population) reside in rural America and having local quality health care is important to them.
- **Saves time, travel, and other expenses**
Telemedicine entails moving from a service delivery system in which patients (and often parent or guardian) physically travel from a rural area where they reside to an urban area to consult with a medical specialist, to a system in which the specialist consults with the patient and rural primary care provider using telecommunications facilities. An obvious opportunity is the potential for transportation cost savings, such as the potential for saving a portion of the millions spent annually on patient automobile travel expenses, emergency air evacuations or other forms of transporting patients across the large expanses of rural America.
- **Healthcare at home**
Home care and community based health services are becoming an increasingly important part of the healthcare service continuum. There are many reasons for this including: patients are leaving hospital sooner and need some additional care at home while they recover, treating patients at home is less expensive than treating them in the hospital, many patients prefer to stay in their homes as long as possible before moving onto a higher level of healthcare service, e.g. nursing home, hospice. A research project found that telehome care allowed home care nurses to "see" more patients in a day, decreased the visit time and ended up costing 33-50% less than the traditional home care visit.
- **Health provider integration**
Improved collaboration between providers (e.g., shared access to electronic medical records and provider to provider consultations) provides patients with enhanced confidence that all that can be done is being done.
- **Comfort-level with the technology**
Television and computer applications are more common and not a foreign concept. Patients are now more at ease and accepting of the use of this application of technology.

PROVIDER'S PERSPECTIVE

- **Emergency Room “front line” support**

Instant access to information, whether it be about a certain patient or a certain topic, can be essential or even life saving. Here we cite the story of a rural doctor who had never before done an amputation being helped through the procedure by a well-practiced physician over a video link. The two saved the life of the amputee, who did not have enough time to reach the larger facility.¹⁴

- **Accuracy of diagnosis / reduction of medical errors**

Reduction of medical errors is a huge concern for the medical community.¹⁵ Getting it right on the first try is obviously the preferred way of doing things. With “tele-assistance” (e.g., communication with specialists), it is hoped that it will be easier for a doctor to get a “second opinion” on their diagnosis of a patient. With greater access to help, more patients will be treated correctly, the first time. This leads to even more benefits, such as quicker average recovery time, less use of unneeded medicines, and reduced costs to patients and hospitals.

- **A multifold increase in efficiency**

Travel times for patients and doctors could be significantly reduced as well as research time and “paper handling” of medical records (which can be unbearably slow). It has already been seen that telemedicine on foreign military bases has sped up the whole process of treatment for soldiers abroad. Consultations from major medical centers to the military bases make diagnosis quicker and more accurate. Telemedicine saves time over traditional “paper-based” data transfer.

- **Continuing Medical Education / Lifelong learning**

Telemedicine can enhance educational opportunities for health care providers, patients, and families, improving clinical outcomes and reducing hospitalizations. The opportunity to participate in continuing education on the latest in medical advances without having to travel long distances saves providers time, dollars and minimizes air pollution.

CHALLENGES TO TELEMEDICINE

- **Policy development**

Health care organizations should develop telemedicine policies. To be successful and sustainable, telemedicine must be fully integrated into existing health structures and processes in a practical and policy manner. Integration can be achieved through aligning telemedicine initiatives with existing strategic health plans, policy goal-setting, accompanying action steps, and attention to policy barriers. Establishment of a policy forum that focuses on telemedicine policy would facilitate these needs. Telemedicine policies should incorporate capacity for education, research, and administrative functions, as well as healthcare functions.

- **Expansion of usage**

Education about the nature and scope of telemedicine should further expand utilization. It should also increase the appreciation of the critical issues associated with successful implementation and evaluation, including a fundamental understanding of the technology and financial structures. Adequate reimbursement mechanisms would likely drive a more rapid expansion of telemedicine.

- **Connectivity to rural and remote communities /standards / interoperability**

To facilitate access to many bandwidth intensive telemedicine applications increased broadband

connectivity is needed, particularly to rural and remote communities. Standards need to be defined and agreed on to ensure interoperability of networks and applications. Technology modalities (broadband, narrowband, web-based) and applications (videoconferencing, data monitoring, telephone) should be viewed as synergistic, not competitive, and the most appropriate tool applied (i.e., hybrid connectivity solutions are recommended). A role still remains for simpler technology, such as the telephone, and can be used successfully for patient assessment, triage, monitoring, reminders, or direct intervention.

- **Costs / Evaluation / Outcomes**

Although much anecdotal evidence exists, there is scant hard evidence that the communications technology will provide appropriate health care at a reasonable cost, despite the fact that in certain situations the cost-effectiveness of telemedicine appears obvious. Therefore, before payers and providers are willing to move on the issue, they want to know the likely economic effects of the use of telemedicine. Reimbursement policy issues are further complicated by rapid changes in equipment technology and faster communications networks that are making telemedicine capability more mobile, available for more applications, and with lower equipment costs and operational expenses. Metrics for telemedicine outcomes should be developed to demonstrate sufficient evidence of socio-economic benefit to indicate ongoing investment is appropriate. Evaluations should include examination of the social, cultural, organizational, and policy aspects of telemedicine. Suitable frameworks for economic analysis should capture non-monetary and unintended consequences, as well as monetary measures. Full integration of telemedicine will increase its use and decrease the per contact episode cost. Investment in information and communications technology infrastructure should be considered as an investment not only in health, but also in business, education, and other e-sectors. Sustainable telemedicine ‘programs’ and not ‘projects’ should be targeted.¹⁶

- **Reimbursement / Funding / Sustainability**

Ongoing political developments raise the perennial question about whether telemedicine will survive in the face of reduced federal government grants. More directly, if programs receive fewer grant dollars, what will become of telemedicine practice in the U.S.? Grants can provide the funds for initial capital investment, but programs need to devise, right up front, a business plan for keeping this going after the seed money is gone. Telemedicine is a cost center, not a revenue center. Information technology is also a cost center, proving you have to have them even if it doesn't make money. Telemedicine can be used to drive patients to revenue centers, as well as a pathway to revenue generating centers. We need to explore traditional as well as non-traditional sources of funding, including internal revenue sources, government grants, corporate support, public and private insurers, and statewide purchasing groups.

- **Human factors**

A critical hurdle must be overcome if telemedicine is to have a favorable impact on health care. The products and systems, processes, and procedures that make up telemedicine must be usable. The degree to which telemedicine's components are usable will either inhibit or facilitate its acceptance, use, and growth and its effectiveness as a model for medical care provision. Poor usability could at a minimum retard the growth of telemedicine and drastically reduce acceptance of telemedical technologies. The addition of nonprofessionals to the ranks of users will amplify the role of human factors in facilitating interaction in telemedical areas. This large audience will be less educated and less sophisticated than practitioners and will include a wide range of capabilities and limitations.¹⁷

- **Liability, malpractice**

The changes telemedicine will bring to medical practice exacerbate the changes deriving from the proliferation of managed care integrated delivery systems and the contraction of the health care industry.

The solo practitioner revered by Norman Rockwell is rapidly becoming extinct, superseded by groups of providers employed by or engaged in contractual partnerships with one or more integrated managed care plans. The community hospital of the mid-twentieth century has merged, remerged and now emerged as part of an organized network of hospital services, often affiliated with one or more health plans. Among the implications we need to better understand in the context of the changes occurring in the practice of medicine as a result of telemedicine is that of “shared liability” applicable to health plans and managed care entities.¹⁸

- **Interstate licensure**

Telemedicine holds great potential to expand service to medically underserved populations and improve their access to health care. Yet, when patients and practitioners are located in separate states the issue of practitioner licensure arises. State-level licensure laws that regulate interstate telemedicine practice are not uniform from state to state, in part because of the varying political climate. Like any other type of statute, these laws have been shaped by their respective stakeholders, and can be considered either restrictive or reciprocal. A number of states have not passed an interstate telemedicine licensure law and therefore do not fall neatly into either category.¹⁹

- **Confidentiality, security**

Because medical information is connected to telecommunications lines and computers, they will always be at risk. Even with high tech firewalls and other security devices there is a great deal of risk. The electronic misappropriation of health information is very real as there is a market for the sale of private information. Telemedicine practitioners will be held liable for breaches of security and any unauthorized access. The legal issue will be not whether electronic patient information systems can provide airtight security, but whether such systems can provide privacy protection equal to or better than paper record systems. The customary privacy and confidentiality of the medical setting cannot be guaranteed in telemedicine, because the patient's records and medical history are conveyed not only to the consulting physician, but also, by necessity, to several individuals outside the traditional medical team. The transmission procedure requires technical staff at both ends. In small communities, it is possible that the patient knows the nonmedical personnel socially, compounding the sense of loss of privacy. Thus, the nature of the doctor patient relationship changes dramatically with telemedicine, challenging traditional concepts of privacy and confidentiality.²⁰

- **Investment Opportunities**

Research, development and investment opportunities abound in this rapidly growing arena. Opportunities in telemedicine technology include equipment sales, transmission, service and maintenance. The sector is ripe with opportunities for information technology vendors and service and training providers.²¹

The advent of telemedicine brings some very useful technology to the medical community of the Oregon and the rest of the U.S.. Yet many challenges remain ahead. Everything about the suggested programs for telemedicine also depends on the hurdle of availability. **WILL BROADBAND INTERNET SERVICES BE AVAILABLE TO ALL AMERICANS?** Within the answer to this question lies the answer to whether telemedicine is going to be a beneficial product of the technological age.

Telemedicine, if used to its full extent, has the potential to cause great and far-reaching effects on the field of medicine. That is why it is important to take a look at the possibilities and limitations now. In that way we prepare to make the most of the technology available to us in the 21st Century.

AUTHORIZATION

The Telehealth Association of Oregon (TAO – www.ortehealth.org) authorized the development of this white paper. The TAO’s purpose is to support the use of telecommunications to improve access to high quality health care and other allied services by Oregonians.

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Related Information

Please Note: There is a wealth of reference material on telehealth. Please contact the author or TAO for further information.

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